PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Munehisa FUJITA, et al.

Appln. No.: 08/915,683

Confirmation No.: 1847

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Docket No: Q386121

Group Art Unit: 1752

Examiner: WALKE, Amanda C.

For: DIRECT POSITIVE PHOTOGRAPHIC SILVER HALIDE EMULSION AND COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL COMPRISING SAME

SECOND SUPPLEMENTAL DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Takefumi HARA, do hereby declare and state as follows:

I am the same declarant who performed the experimentation described in the Supplemental Declaration Under 37 C.F.R. § 1.132 signed on September 2, 2002, and filed on September 18, 2002. My personal history remains as stated in my prior Declaration.

This Second Supplemental Declaration provides a detailed explanation of the test results contained in my prior Supplemental Declaration.

(1) In preparation of Emulsion Nos. 1 to 24 in my prior Supplemental Declaration under 37 C.F.R. §1.132, the amount and pBr value of Compound A (3,6-dithia-1,8-octadiol) were varied for the following reasons.

Compound A has hitherto been known in this field of art as described, for example, in U.S. Patent 3,574,628. <u>Compound A is a solvent for a silver halide emulsion, but not a sulfur sensitizing agent.</u>

When the emulsions were prepared in the experimentation described in the prior Supplemental Declaration under 37 C.F.R. §1.132, the amount of Compound A and pBr value were varied to prepare emulsions differing in the coefficient of variation of the distribution of grain thickness. At the same time, the average grain thickness, namely, the "a" values and the "b" values, of all the emulsions were maintained at almost the same values, respectively. When the amount of Compound A and pBr value are appropriately varied, emulsions differing from one another in coefficient of variation of the distribution of grain thickness can be prepared.

The emulsions required for the experimentation described in the prior Supplemental Declaration under 37 C.F.R. §1.132 differ from one another only in the coefficient of variation of the distribution of grain thickness, which is the subject matter of the present invention, but have almost the same grain shape. As such, these are true comparisons which demonstrate the effect of a change in the coefficient of variation of the distribution of grain thickness. Such emulsions can be prepared by controlling the above-noted parameters, i.e., the amount of Compound A and pBr value. The experimentation in the prior Supplemental Declaration under 37 C.F.R. §1.132 could not have been conducted if these parameters had not been varied.

When all conditions for preparing the emulsions are completely the same, it is impossible to prepare a plurality of emulsions differing from one another in "coefficient of variation of the distribution of grain thickness". It is clear that some change of parameters must be entailed. When the respective emulsions are compared, the difference in properties is ascribable to the difference in the coefficient of variation of the distribution of grain thickness.

This is explained as follows.

U.S. Patent 3,574,628 describes that even when emulsion grains are prepared using Compound A, the sensitivity may increase and D_{max} may increase. However, U.S. Patent 3,574,628 does not describe that when Compound A is used, the sensitivity may decrease and D_{max} may decrease. As shown in the experimentation contained in my prior Supplemental Declaration under 37 C.F.R. §1.132, the larger the addition amount of Compound A, the larger the "coefficient of variation of the distribution of grain thickness" of the resulting emulsions. The emulsions falling within the scope of the comparative examples have a lower sensitivity and D_{max}, opposite what one would expect. Clearly then, the difference in properties cannot be ascribed to the amount of Compound A.

(2) The relationship of D_{max} and negative sensitivity is explained as follows.

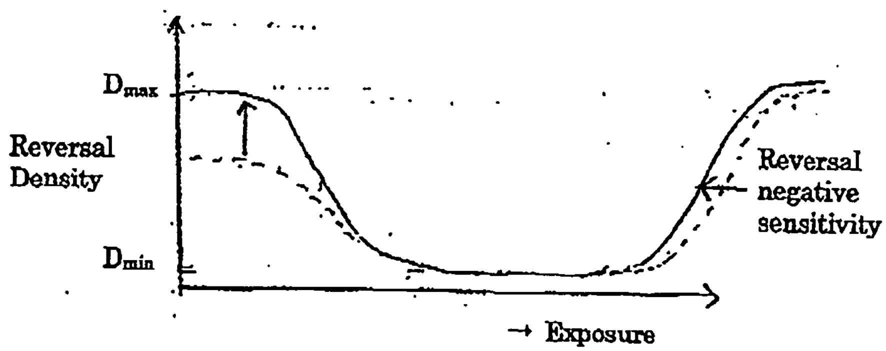
The negative sensitivity of a core/shell type auto-positive emulsion (direct reversal emulsion) is obtained by developing a surface latent image obtained, upon exposure to light, by not completely capturing photoelectrons at an inside electron trap, but rather by capturing residual photoelectrons at a surface electron trap. That is, when the strength of the inside electron trap is weak or the amount of the electron trap is insufficient, a latent image is easily formed on the surface to increase negative sensitivity. On the other hand, when the inside electron trap is strong or the amount of the electron trap is large, the negative sensitivity decreases.

Generally, when the inside electron trap is enhanced and the amount of the electron trap is increased, the D_{max} of the direct positive image tends to decrease. This is because the

electrons are easily trapped inside. It then becomes difficult to carry out surface development which results in a decrease in density.

That is, when the inside electron trap is strong, the negative sensitivity generally decreases and D_{max} decreases. It is difficult to combine a decrease of negative sensitivity and an increase in D_{max}. However, such a combination is preferred in view of performance capability. In the present invention, attaining this very combination is unexpected. This is because it is contrary to and the opposite of the change in characteristics that is normally obtained when the negative sensitivity is decreased.

Further, a pattern diagram showing a characteristic curve of a direct reversal emulsion is given below.



In a direct reversal emulsion, a negative image is formed at the region where the exposure amount is large. When the negative sensitivity is increased, the following troubles arise. For example, when a portrait against the background of a glass window is photographed by means of a flash, black spots are observed on the glass window in the photograph obtained by conducting

the photographic processing which thereby completely ruin the photograph as the case may be. This trouble can be solved by decreasing the reversal negative sensitivity. However, in a conventional emulsion, the decrease in the negative sensitivity simultaneously decreases D_{max}. On the contrary, an increase in D_{max} increases the negative sensitivity. When the negative sensitivity is increased, the aforementioned troubles arise and when D_{max} is decreased, the image quality is deteriorated.

In the present invention, because D_{max} of the direct positive image is increased and an increase in reversal negative sensitivity can be suppressed, an unexpectedly superior effect is achieved.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: February 28, 2003

Takefumi Hara
Takefumi HARA